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Occupational Stress: Firefighters

(Labour Bibliography; No. 114)

1989 April

Occupational Stress: Firefighters

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Our library has a few of these items, as shown by a star * .

Some of the articles are not in English, but at least these abstracts are in English.

The table of contents on page 2 shows the title (and year) of each article and the page where the citation and the abstract will be found.

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A. Stress

CANADIANA

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ISN: 34734

Author(s): Lawrence, A.M.

Title / Statement of responsibility: Firefighter burnout / by Anne-Marie Lawrence

Publisher or Source of Document: Canadian emergency services news. July/Aug. 1982 p. 96-98

CIS Descriptors: Mental stress, Mental health, Overstrain, Mental attitude, Motivation, Fire fighting, Fire services

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ISN: 142832

TITLE: Psychological Problems Arising from Disaster Work
CONTROL NUMBER: NIOSH-00166449
AUTHOR: Duckworth, D. H.
SOURCE 1: Stress Medicine, Vol. 2, No. 4, pages 315-323, 30 references
PUBLICATION DATE: 86-10-00
ABSTRACT: A case study, using a problem solving exercise, was carried out to investigate the psychological disorders experienced by police officers who were on duty during a disastrous fire. A total of 234 of the 399 officers who helped during the fire completed a 60 item general health questionnaire, and 34 officers averaging 34 years of age and 11 years of service received counseling. From the questionnaires it emerged that the officers were affected by somatic sequelae and anxiety problems. In addition, some of the officers could not perform tasks (domestic or other) in the same manner as they did before helping in the disaster. There was evidence of performance guilt, reconstruction anxiety, general irritability, focused resentment and motivational shifts in the 34 officers who underwent counseling. At follow up, 9 months after the fire, 33 of the officers who received counseling reported improvement while one had further temporary problems. The author concludes that even experienced persons are affected by major human disaster conditions, and that thorough information of the pertinent symptomatology is valuable for the identification of individuals affected by disaster related psychological disturbances.

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ISN: 118538

TITLE: Psychological Stress In Firemen's Work
CONTROL NUMBER: NIOSH-00139880
AUTHOR: Kalimo, R., and A. Lehtonen
SOURCE 1: Nordisk Psykologi, Vol. 32, No. 1, pages 74-79, 4 references
PUBLICATION DATE: 80-00-00
ABSTRACT: A survey of psychological stress among Finnish firefighters was conducted. Questionnaires were administered to 260 firefighters and workers at an alarm center and to an unspecified number of firefighters in a small city and a rural community. The questionnaires provided data about work and the working environment, work content and organization, opportunities for participation in work planning and decision making processes, job responsibility, social contacts, expectations and desires concerning work, job satisfaction, and subjective stress reactions. Approximately 35 percent of the subjects considered the defined requirements for work skills to be high. Twenty percent felt that their work skills and education were under utilized. Fifty percent of the firefighters considered it difficult to make decisions during fire fighting and rescue operations. The subjects perceived their chances of influencing the planning of work as small. Eighty percent of the firefighters complained about working hours. Fifty percent regarded their work as psychologically and physically hard. Ninety percent felt tired after the usual 24 hour work period. The most common causes of stress were quantitative overload, interruption of sleep, and problems with working hours. Fifty seven percent of the firefighters felt more than moderately tired after a work period in the alarm center, whereas 20 percent complained of a moderate fatigue after firefighting and rescue work. The authors conclude that despite their criticism of the work organization and poor chances of influencing work planning, firefighters are generally satisfied with their jobs and exhibit no chronic symptoms of mental health problems. This situation may reflect the fact that many of the firefighters have been chosen on the basis of their personality characteristics. (Swedish)

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ISN: 102470

TITLE: Prescription of Vocational and Leisure Activities: Practical Aspects

CONTROL NUMBER: NIOSH-00084625

AUTHOR: Hellerstein, H. K.

SOURCE 1: Advances in Cardiology, Vol. 24, pages 105-115, 4 references

PUBLICATION DATE: 78-00-00

ABSTRACT: A population of 333 men chosen at random from seven different occupations were studied at their occupational and leisure activities to determine stresses and stressors in order to derive a prescription for cardiac rehabilitation. Determined were the value of standard amplified physical performance tests and new modifications of performance tests suggested to enhance cardiac rehabilitation. Factory and steel mill workers, surgeons and anesthetists, firemen, radio and television workers, and businessmen were the occupational groups. Test results from clinical laboratory evaluation of the subjects were obtained, and the results contrasted markedly with observations of subjects at their usual occupations. Stresses and stressors of work were distinguished in type and magnitude from that of exercise tests. The stress of standardized exercise tests is mainly muscular, usually of the lower extremities to minimal peak levels, and in a controlled physical environment. Except for the firefighters, energy expenditure was low and the peak blood pressure and heartrate were low. Although exercise tests are not predictive of the circulatory responses at equal energy levels in most occupations, it was concluded that they provide reasonable information about myocardial oxygen capacity and the tolerance to increases of heartrate and blood pressure at work.

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ISN: 86991

TITLE: A Study of the Responses of Firefighters to Fire Fatalities
CONTROL NUMBER: NIOSH-00113573
AUTHOR: Murin, E. C., and G. R. Williams
SOURCE 1: Journal of Fire and Flammability, Vol. 11, No. 1, pages 45-62, 18 references
PUBLICATION DATE: 80-01-00
ABSTRACT: Responses of firefighters (SIC-7399) to discovering a dead body at the fire sight were surveyed. Thirty five firefighters, who had at one time during their career discovered a body at the scene of the fire completed a questionnaire on their emotional reactions and coping mechanisms. The age of the victim influenced the intensity of the firefighters' reactions, but the sex of the victim did not have a strong effect. Most of the firefighters tried to resuscitate victims of smoke inhalation and felt sadness, failure, or anger if resuscitation attempts failed. Responses to the discovery of a dead body included helplessness, trying to keep busy with other tasks to put thoughts of the victim out of mind, anger, nausea, and use of nicknames to refer to the body. The firefighters also felt the need to talk about discovery of the body with their coworkers, friends, or family. Most subjects were not reluctant to respond to the next call and did not consider changing jobs. Younger firefighters tended to use nicknames for the victims more frequently than older workers, experienced feelings of anger more frequently, joked about the victims more often, and reported more need to discuss the incident. Responses were less intense for firefighters who had discovered more victims. The authors conclude that discussion of the incident is a healthy way for firefighters to cope with the stress of discovering dead bodies. They suggest that a study similar to this one be conducted for other groups who deal with death, such as policemen, paramedics, and emergency room technicians. Most studies are needed on coping mechanisms and death in order to define healthy stress management strategies.

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TITLE: Effects of Altitude and Heat on Complex Cognitive Tasks
CONTROL NUMBER: NIOSH-00110088
AUTHOR: Fine, B. J., and J. L. Korbrick
SOURCE 1: Human Factors, Vol. 20, No. 1, pages 115-122, 15 references
PUBLICATION DATE: 78-02-00
ABSTRACT: The effects of heat and altitude on the performance of complex cognitive tasks were studied. Twenty-eight male subjects were trained to perform complex tasks including decoding messages, recording meteorological data and military target information, and calculating artillery sites using a slide rule and computation table. Conditions simulated actual artillery fire detection center conditions as closely as possible. Subjects performed these tasks for 7 hours daily for 4 consecutive days under control conditions or while exposed to 4300 meters of altitude or to 35 degrees C of heat. Errors on each task were scored as percent of total responses. Heat stress and altitude each affected performance significantly, and impairment increased with exposure duration, reaching a maximum of 32 percent errors. Both types of environmental stress produced approximately equal performance decrement, but individual subjects responded differently to each type of stress. The authors conclude that heat and altitude markedly affect cognitive performance. They suggest that conflicting results from previously reported studies can be attributed to the use of tasks with little meaning, in contrast to the complex real world tasks used in this research.

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* ISN: 81857

TITLE: Psychological and Biochemical Strain in Firemen's Work
CONTROL NUMBER: NIOSH-00104713
AUTHOR: Kalimo, R., A. Lehtonenj, M. Daleva, and I. Kuorinka
SOURCE 1: Scandinavian Journal of Work, Environment, and Health, Vol. 6, No. 3, pages 179-187, 19 references
PUBLICATION DATE: 80-00-00
ABSTRACT: The effects of work conditions on the health of firemen were studied in Finland. A total of 260 firemen completed a questionnaire which contained items on job stress, job satisfaction, fatigue and stress symptoms. Mental load was rated higher than physical load by 50 percent of the firemen. Job satisfaction was greater than average for 89 percent of the respondents. Psychological symptoms were rare. At the end of a work shift, 42 percent of the firemen experienced fatigue. Ambulance service and shifts in the alarm center were perceived as more fatiguing than firefighting and rescue tasks. Among operators working at the fire alarm center, urinary excretion of 17-ketogenic steroids was increased, and the circadian pattern of excretion was altered. Among female alarm operations, excretion of adrenaline and nonadrenaline was decreased. The authors recommend that the working hours and the tasks done within the daily work period be reorganized. Specialized training should be used to help operators cope with stressful situations.

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ISN: 68798

TITLE: A Study of the Strain in Firemen's Work
CONTROL NUMBER: NIOSH-00095042
AUTHOR: Kuorinka, I , R. Kalimo, O. Korhonen, R. Kytovuori, A. Lehtonen, and S. Tola
SOURCE 1: Tyoterveyslaitos, 67 pages, 35 references
PUBLICATION DATE: 77-00-00
ABSTRACT: Stress factors in firemen's work were investigated. Psychological and physical stresses were evaluated, and firemen's duties and viewpoints regarding occupational medicine were surveyed. A questionnaire was designed to identify stress factors, and to what extent firemen have experienced symptoms of abnormal psychological or physical stress. Physical strain was measured by recording heart rates of firemen during an entire 24 hour shift. No average stress typical to a certain function was observed. The physical condition of firemen was measured by using a submaximal stress test. Psychological measurements were directed at the activities of the adrenal gland, and urine samples were collected to determine epinephrine, norepinephrine, and corticosteroid secretion. No unusual disturbances in the psychological and physical health of the firemen were observed. (Finnish).

B. The Heart

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ISN: 134342

TITLE: Heart Problems And The Fire Fighter
CONTROL NUMBER: NIOSH-00156769
AUTHOR: Davolos, D. D.
SOURCE 1: Proceedings of a Symposium on Occupational Health and Hazards of the Fire Service, International Association of Fire Fighters, pages 63-68
PUBLICATION DATE: 71-00-00

ABSTRACT: Heart disease in fire fighters (SIC-9224) is discussed. In the Los Angeles fire department, heart attack accounts for 2.5 percent of all injuries, but accounts for 25 to 75 percent of deaths, and over 50 percent of disability payments. One study indicates the risk of heart disease among fire fighters is much higher than in the general population. Of 12 male fire fighters with severe heart disease in Cincinnati, 9 were very low coronary risks by known criteria of weight, blood pressure, blood uric-acid, and blood cholesterol. They were physically active and without excess emotional stress. General factors in heart disease in males are examined with respect to epidemiological studies. The A-1 personality has behavior patterns related to the genesis of coronary heart disease. Coronary heart disease probably starts in males when they are in their teens and becomes progressively worse. Risk factors in fire fighters include repetitive exposure to severe stresses, extreme heat and cold, humidity, and carbon-monoxide (630080). Evidence exists that fire fighter heart disease is due to heart cell death, a coronary heart disease caused by a lack of oxygen, an excess of carbon-monoxide, and perhaps other unknown factors. Some solutions to the problem include a safety officer at fires, and a physical fitness program and computerized health program for every fire fighter. A possible computerized program is described.

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TITLE: Firefighter's Reaction to Alarm, an ECG and Heart Rate Study
CONTROL NUMBER: NIOSH-00119658
AUTHOR: Kuorinka, I., and O. Korhonen
SOURCE 1: Journal of Occupational Medicine, Vol. 23, No. 11, pages 762-766, 20 references
PUBLICATION DATE: 81-11-00
ABSTRACT: Heart rate and electrocardiographic ECG changes of firemen during alarms were studied. The ECGs of 22 firemen were continously monitored by telemeter over a 24 hour period. In addition, each man was assigned an observer who both operated the monitoring system and recorded the firemen's activities. Sixty alarms were recorded during the study. Mean aerobic fitness of the firemen was normal. The mean rise in pulse rate from baseline to peak following the alarm was 61 beats per minute. More physically fit men had slightly higher peak pulse rates. The ECG reactions were minor and the changes were within physiological limits. The authors note that the absence of dramatic signs of stress may be the result of the excellent training and experience of the firefighters. They urge the adoption of stress reducing measures, such as more informative alarm systems and more efficient operating strategies to allow more time for getting to trucks and target areas.

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ISN: 87057

TITLE: Cardiovascular and Sympathetic Reactions to in-Flight Emergency Responses Among Base Fire Fighters

CONTROL NUMBER: NIOSH-00099786

AUTHOR: Hurley, B. F., S. P. Glasser, C. P. Phelps, D. Anderson, R. C. Blair, and C. E. Riggs

SOURCE 1: Aviation, Space, and Environmental Medicine, Vol. 51, No. 8, pages 788-792, 22 references

PUBLICATION DATE: 80-00-00

ABSTRACT: Occupational stress in firefighters was investigated by assessing cardiovascular and sympathetic reactions to in-flight emergencies. Twelve firefighters were monitored during sudden arousal from sleep in response to emergency and simulated emergency conditions. Heart rate (HR), blood pressure, and plasma norepinephrine (NE) concentrations were monitored. Mean HR increased between 80 and 112 percent. Systolic blood pressure increased between 7.6 and 14.6 percent. Statistical analysis showed a significant difference in NE and cardiovascular variable between rest and emergency responses. A significant difference was observed between the emotional arousal component and the physical activity component for HR and rate pressure product. The authors conclude that, the firefighter's response to an emergency produces considerable occupational stress after sleep arousal, but it does not appear to induce cardiac rhythm disturbances in healthy individuals.

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* ISN: 60992

TITLE: "Ischemic" Heart Disease in Fire Fighters with Normal Coronary Arteries

CONTROL NUMBER: NIOSH-00070855

AUTHOR: Barnard, J. R., G. W. Gardner, and N. V. Diaco

SOURCE 1: Journal of Occupational Medicine, Vol. 18, No. 12, pages 818-820, 20 references

PUBLICATION DATE: 76-12-00

ABSTRACT: Near maximal stress testing conducted on a group of 90 randomly selected Los Angeles City fire fighters revealed that 10% had ischemic electrocardiographic (ECG) changes. The ischemic ECG responses were confirmed during a second test conducted 2-4 weeks after the initial test. Coronary heart disease (CHD) risk factor analysis revealed that in general the men were not at high risk for CHD. Six of the nine men elected to undergo cardiac catheterization and angiography. One patient had severe triple vessel disease and subsequently underwent aorto-coronary bypass surgery. Another had 50% obstruction in the circumflex branch of the left coronary while the other four men had no visible signs of coronary obstruction. The men with "normal" coronaries, however, did show signs of abnormal heart function during atrial pacing. One man had cardiac enlargement, hypokinesis, ischemic ECG and abnormal lactate metabolism. Another had abnormal lactate metabolism and ischemic ECG. A third man had moderate cardiac enlargement with anterior wall hypokinesis. The fourth had ischemic ECG changes with angina but otherwise normal cardiac function. All 4 of these men had pressures which were within normal limits. These data show that some fire fighters have ischemic heart disease with patent coronary arteries. This disease may be due to job related factors (i.e. carbon monoxide and other noxious fumes, catecholamines, etc.) which reduce myocardial oxygen supply or greatly increase myocardial oxygen demands.

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* ISN: 59152

TITLE: Near-Maximal ECG Stress Testing and Coronary Artery Disease Risk Factor Analysis in Los Angeles City Fire Fighters

CONTROL NUMBER: NIOSH-00050316

AUTHOR: Barnard, R. J., G. W. Gardner, N. V. Diaco, and A. A. Kattus

SOURCE 1: Journal of Occupational Medicine, Vol. 17, No. 11, pages 693-695, 10 references

PUBLICATION DATE: 75-11-00

ABSTRACT: Near-maximal electrocardiographic (ECG) stress testing and coronary artery disease risk factor analysis are conducted on a randomly selected group of 90 Los Angeles City Fire Fighters ranging in age from 40 to 59 years. Comparisons of the fire fighters to Los Angeles insurance underwriters (controls) of the same age show cholesterol values greater than 260 milligram percent--12% of the fire fighters and 18% of the controls; blood pressure greater than 160/90--2% and 25%, respectively; smokers--32% and 26%, respectively. Only one fire fighter had all three risk factors elevated, five had two elevated, and 47 had none. Ten percent of the fire fighters a had ischemic stress responses compared with 8% for the controls. Because of the incidence of ischemic stress response in the fire fighters, who are medically selected for low risk to coronary heart disease, ischemic heart disease is considered job related.

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ISN: 27300

TITLE: Heart Disease among Fire Fighters Part 2
CONTROL NUMBER: NIOSH-00032792
AUTHOR: Skolnick, M. H.
SOURCE 1: International Fire Fighter, Vol. 47, No. 5, pages 8-9
PUBLICATION DATE: 64-06-00
ABSTRACT: Heart disease is discussed as an occupational disease among fire fighters. The sudden, loud, and frequent ringing of the fire-alarm bell has been recognized by medical authorities as influencing heart action by shocking the nervous system. To alleviate this, some fire departments have installed bells which reach their full ringing capacity only after a few seconds. In many duties of fire fighters, heart damage may be temporary, although permanent injuries to the vital mechanisms of the heart function may result. A clinical case is described to illustrate the significant role that stress factors have in the precipitation and development of heart ailments among fire fighters. The most important factor in the case is that of excessive physical exertion which led to coronary thrombosis. The patient required emergency hospitalization, and examinations established the diagnosis of acute coronary thrombosis. Medical authorities substantiate the opinion that extrinsic forces may act as the precipitating cause of coronary thromobosis. Other predisposing factors include many diseases, such as diabetes, hypertension, myocarditis, tuberculosis, syphilis, arterial diseases, and other chronic ailments. Less common types of coronary thrombosis occur between the ages of 30 and 50, without the presence of a predisposing disease.

C. Other Physical Signs

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ISN: 152574

TITLE: Physiological Responses of Fire Fighters to Workload and Thermal Stress

CONTROL NUMBER: NIOSH-00176052

AUTHOR: Skoldstrom, B.

SOURCE 1: Ergonomics, Vol. 30, No. 11, pages 1589-1597, 11 references
PUBLICATION DATE: 87-11-00

ABSTRACT: A method to determine the heat load of the fire fighter with regard to working time was described. Eight healthy male fire fighters were assessed for physical work performance while wearing fire brigade uniforms and breathing apparatus at temperatures of 15 and 45 degrees-C. A workload corresponding to 20 percent of the maximal oxygen uptake without equipment and 30 percent of the maximal oxygen uptake with equipment was attained by having the subjects walk on a treadmill at a speed of 3.5 kilometers per hour for 60 minutes. Measurements during the experimental sessions included deep body temperature, skin temperature, heart rate, perceived physical exertion, and oxygen uptake. Oxygen uptake increased with increased workload but was not affected by thermal stress. The heart rate in beats per minute for the respective experimental sessions with and without equipment was 100 and 75 at 15 degrees-C and 169 and 96 at 45 degrees-C. Perceived physical exertion showed a similar pattern to heart rate under these conditions. The use of equipment during exercise increased the rectal temperature from 37.3 to 37.5 degrees-C at an ambient temperature of 15 degrees-C and from 37.6 to 38.7 degrees-C at an ambient temperature of 45 degrees-C. Skin temperature showed comparable increases. Analysis of variance showed a significant interaction between heat and equipment and between heart rate and heat storage rate. The author concludes that exhaustion under conditions of heavy, hot work is due to the combined effects of heat and heavy equipment.

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ISN: 151178

TITLE: Physiological Responses to Fire Fighting Activities
CONTROL NUMBER: NIOSH-00174775
AUTHOR: Romet, T. T., and J. Frim
SOURCE 1: European Journal of Applied Physiology and Occupational Physiology, Vol. 56, No. 6, pages 633-638, 11 references
PUBLICATION DATE: 87-09-00
ABSTRACT: Physiological responses associated with various fire fighting activities were studied. The subjects were eight healthy male fire fighters. Heart rate, rectal temperature, and skin temperature were collected for 23 man runs during six fire fighting scenarios. Significantly higher heart rate and temperatures were recorded for the fire fighter who first entered the building, evacuated the victims, or engaged in fire fighting. The subjects who entered the building at a later time had similar heart rates and temperatures as the exterior fire fighters. The smallest change was shown by the crew captain. The authors conclude that fire fighting is strenuous work for those entering the building, searching for and rescuing victims, and fighting the fire. The physical requirements for other activities are considerably less demanding. The results suggest that heart strain injury could perhaps be reduced by frequently rotating duties with crew members who are normally responsible for less strenuous tasks.

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ISN: 96457

TITLE: Fire Fighters Medical Research
CONTROL NUMBER: NIOSH-00121752
AUTHOR: Anonymous
SOURCE 1: International Association of Fire Fighters, Washington, D.C., 93 pages, 8 references
PUBLICATION DATE: 73-02-13
ABSTRACT: A series of medical research articles on the occupational hazards of firefighting were presented. Case histories of pulmonary dysfunction and coronary diseases were included. Pneumonia was reported to be among the leading, disabling occupationally related disease among firefighters. Heart disease and tuberculosis were reported as the two most commonly occurring chronic diseases among firefighters. Etiologic factors, such as temperature extremes, trauma, stress, and exposure to smokes and gases, were presented. The authors suggest a stringent program for the prevention of occupationally related disease among firefighters.

D. Hazards in General

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ISN: 106368

TITLE: Health Hazard Evaluation Report, No. HETA-81-137-990, Federated Fire Fighters of Nevada, Las Vegas, Nevada
CONTROL NUMBER: NIOSH-00127266
AUTHOR: Jannerfeldt, E.
SOURCE 1: Hazard Evaluations and Technical Assistance Branch, NIOSH, Cincinnati, Ohio, 18 pages, 14 references
PUBLICATION DATE: 81-11-00
ABSTRACT: Respiratory and psychological symptoms exhibited by firefighters involved a fire in Las Vegas that resulted in numerous fatalities were investigated. The study was requested by the Federated Fire Fighters of Nevada (SIC-9224) and was performed on January 15 to 20, 1981. A questionnaire concerning acute and persistent health problems and psychological trauma was completed by 356 of about 400 firemen who attended the fire. The firefighters had a high prevalence of upper respiratory tract symptoms, increased irritability, and sleep disturbances. Thirty eight percent reported one or more physical symptoms and 50 percent reported one or more psychological symptoms. Many of the symptoms persisted for several weeks. The author concludes that a large proportion of the firefighters suffered acute effects due to exposure to smoke and fumes. The author suggests that persistent symptoms are caused by the accumulated effects of several years of repeated exposure to high concentrations of smoke and fumes and, to a certain extent, to the psychologically demanding nature of the job. Recommendations are offered for periodic physical examinations, stress tests, and group and individual counseling sessions.

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ISN: 85478

TITLE: Occupational Hazards of the Fire Service
CONTROL NUMBER: NIOSH-00111856
AUTHOR: Irwin, C. W.
SOURCE 1: NFPA Fireman, No. F20-3, pages 2-8
PUBLICATION DATE: 53-00-00

ABSTRACT: The occupational injuries and illnesses of firefighters (SIC-9224) are reviewed. Individual causes of disability, ranging from emotional instability to fatigue to lack of training, are described, and the contribution of inadequate equipment to firefighting injuries is discussed. Types of occupational health hazards are summarized, and include respiratory diseases, gas poisoning, cancer of the lungs, cardiovascular diseases, emotional stress, and physical trauma. The author concludes that adequate protective clothing and equipment, proper personnel selection and training, amending the disability laws to permit partially disabled firemen to continue to work in less demanding fire department jobs, and proper treatment of occupationally related illnesses and injuries would simultaneously reduce mortality and morbidity among firefighters and maximize firefighting capabilities.

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ISN: 40616

TITLE: Work in Hot Environments and Protection Against Heat
ACCESSION NUMBER: CIS 539-1971
CONTROL NUMBER: NIOSH-00038259
SOURCE 1: The Iron and Steel Institute, London, ISI Publication 130, 55 pages, 125 references
PUBLICATION DATE: 70-00-00
ABSTRACT: Although concerned primarily with the practical aspects of protection against heat, this handbook does not neglect the scientific principles. Introductory chapters cover influence of climate on physiology, the body's heat balance, limits of human performance, heat radiation, measurement of climatic factors, and evaluation of microclimate. Subsequent chapters are devoted to aptitude for employment in hot workplaces, rules for drinking, and illness resulting from employment in hot workplaces. Considerable space is devoted to technical preventive measures: ventilation, air conditioning, insulation, protection against heat radiation by reflection and absorption; goggles, local and indirect protective measures. Adaptation and personal protective equipment are discussed in detail. In conclusion, data are provided on certain hot workplaces and on the heat stress involved in fire fighting.

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ISN: 28025

TITLE: Occupational Medical Criteria for the Assessment of Work Capacity and Fitness of Firemen in Active Service
ACCESSION NUMBER: CIS 74-573
CONTROL NUMBER: NIOSH-00035506
AUTHOR: Reum, P. J., H. Kaseberg, and M. Klingbeil
SOURCE 1: Unser Brandschutz, Berlin, supplement 4, pages 49-54, 32 references
PUBLICATION DATE: 73-00-00
ABSTRACT: The requirements for the development of occupational medical criteria to assess the working capacity and fitness in firemen are an objective representation of the working conditions, on the one hand, and the recording and evaluation of stress and exposure data, on the other. The various factors to be taken into consideration are described in detail. (German)